

Standards for Mathematical Practice

Specific expectations for grade bands K-2, 3-5, 6-8 and 9-12 can be found starting on page 97 of the Alaska English/Language Arts and Mathematics Standards document.

	Mathematically proficient students will:
1. Make sense of problems and persevere in solving them.	<ul style="list-style-type: none"> • explain the meaning of the problem to themselves. • look for a way to start and note the strategies that will help solve the problem. • identify and analyze givens, constraints, relationships and goals. • make inferences about the form and meaning of the solution. • design a plan to solve the problem. • use effective problem solving strategies. • evaluate the progress and change the strategy if necessary. • solve the problem using a different methods and compare solutions. • ask, “Does this make sense?”
2. Reason abstractly and quantitatively.	<ul style="list-style-type: none"> • make sense of quantities and their relationships in problem solutions. • use two complementary abilities when solving problems involving number relationships. <ul style="list-style-type: none"> ○ Decontextualize- be able to reason abstractly and represent a situation symbolically and manipulate the symbols ○ Contextualize- make meaning of the symbols in the problem • understand the meaning of quantities and are flexible in the use of operations and their properties. • create a logical representation of the problem. • attends to the meaning of quantities, not just how to compute them.
3. Construct viable arguments and critique the reasoning of others.	<ul style="list-style-type: none"> • analyze problems and use stated mathematical assumptions, definitions, and established results in construction arguments. • justify conclusions with mathematical ideas. • listen to arguments of others and ask useful question to determine if an argument makes sense. • ask clarifying questions or suggest ideas to improve/revise the argument. • compare two arguments and determine correct or flawed logic.

<p>4. Model with mathematics.</p>	<ul style="list-style-type: none"> • understand this is a way to reason quantitatively and abstractly (able to decontextualize and contextualize). • apply the math they know to solve problems in everyday life. • are able to simplify a complex problem and identify important quantities to look at relationships. • represent mathematics to describe a situation either with an equation or a diagram and interpret the results of a mathematical situation. • reflect on whether the results make sense possibly improving/revising the model. • ask, “How can I represent this mathematically?”
<p>5. Use appropriate tools strategically.</p>	<ul style="list-style-type: none"> • use available tools recognizing the strengths and limitations of each. • use estimation and other mathematical knowledge to detect possible errors. • identify relevant external mathematical resources to pose and solve problems. • use technological tools to deepen their understanding of mathematics.
<p>6. Attend to precision.</p>	<ul style="list-style-type: none"> • communicate precisely with others and try to use clear mathematical language when discussing their reasoning. • understand meanings of symbols used in mathematics and can label quantities appropriately. • express numerical answers with a degree of precision appropriate for the problem context. • calculate efficiently and accurately.
<p>7. Look for and make use of structure.</p>	<ul style="list-style-type: none"> • apply general mathematical rules to specific situations. • look for overall structure and patterns in mathematics. • see complicated things as a single object or as being composed of several objects. • be able to look at problems from a different perspective.
<p>8. Look for and express regularity in repeated reasoning</p>	<ul style="list-style-type: none"> • see repeated calculations and look for generalizations and shortcuts. • see the overall process of the problem and still attend to details. • understand the broader application of patterns and see the structure in similar situations. • continually evaluate the reasonableness of their intermediate results.